



Materials Safety

Liquid Nitrogen Safety

A Message from Rick Kelly

Rick Kelly has observed that many people within the Division are not being as careful as they should when handling liquid nitrogen. Injuries have occurred at LBNL due to lax handling of LN. Please take a few minutes to review the guidance below and be sure that you have the equipment and training to work safely with all cryogenics.



—Paul Alivisatos,
Division Director

Problem:

Liquid nitrogen is frequently dispensed improperly in the Materials Sciences Division. On numerous occasions MSD staff and students have been seen filling instrumental dewars from hand-held dewars without the use of hand, eye or face protection. In one case, a student filled a dewar well over her head with no protective equipment at all—a spill into her eyes could have caused serious loss of vision. Damaged cryogen gloves and faceshields have been found during recent inspections in labs and at the bulk dispensing stations.

Liquid nitrogen is so common in MSD labs that many people have lost respect for the potential hazards posed by this cryogen. Yet injuries have happened at LBNL. In 2002, an LBNL employee received first and second degree contact burns on her hand when the liquid overflowed while filling a 4 liter dewar. A second employee was nearly splashed in the eye when handling liquid nitrogen without eye protection.

Hazards

Mishandling of liquid nitrogen can pose a range of hazards:

- Eye or skin contact with the cryogenic liquid can cause cold contact burns, potentially resulting in loss of sight or severe skin damage.
- Evaporation of liquid in a confined or poorly ventilated space can displace the air result in an oxygen deficiency.
- Trapping of liquid in an unvented system can cause the build up of extreme pressures as the liquid evaporates, potentially resulting in an explosion.

Safety Precautions

Protective Clothing: The minimum protective gear to be used when dispensing liquid nitrogen is a pair of loose fitting protective gloves (special cryogen gloves or leather) and safety

glasses with side shields. When dispensing liquid nitrogen from a pressurized dewar, or at any time that a splash may occur, a face shield should also be used. While skin contact with a few drops of cryogen usually causes no damage, larger contact should be regarded as an emergency and the individual should go or be transported to Health Services as soon as possible.



Dispensing from Bulk Storage Tanks: Anyone who will be handling liquid nitrogen must complete EHS0231, *Compressed Gas and Cryogen Safety*. You must receive hands-on training from the building manager or other qualified person before you attempt to dispense LN from one of the bulk liquid storage tanks (buildings 2, 62 and 67).

Use in Poorly Ventilated Spaces or Large Superconducting Magnets (along with liquid helium): Contact John Seabury from EH&S (x6547) to have this assessed. You can also contact Rick Kelly at x4088 with any cryogen questions.

